

REMARKS

Claims 1-52 are pending in this application. Claims 19-34 and 47-50 are objected to; and claims 1-18, 35-46, 51 and 52 are rejected. Claims 1, 3, 19, 23 and 47 are amended hereby.

Responsive to the rejection of claims 1-18, 35-46, 51 and 52 under 35 U.S.C. § 103(a) as being obvious by U.S. Patent No. 3,139,375 (Bryand) in view of U.S. Patent No. 3,122,505 (Rulon-Miller et al.), Applicants have amended claims 1 and 3, and submit that claims 1-18, 35-46, 51 and 52 are in condition for allowance.

Bryand '375 discloses a suction roll assembly (Figs. 1-3) which includes a honeycomb openwork 30 which may be used as a foraminous hollow cylindrical covering for a cylindrical roll 89 (column 3, lines 28-32). Strips 31, 32, 33 and 34 may be of stainless steel, or preferably, of synthetic plastic such as PTFE or "Teflon", combined with other inert materials and commercially available as "Rulon A" or that they be of fluorocarbon resin or the like (column 3, lines 65-72).

Rulon-Miller et al. '505 disclose a bearing composition where PTFE is combined with glass fibers so that the resistance to abrasion is further materially increased, and the coefficient of friction is reduced (column 1, lines 60-68). The glass fibers are prepared by burning off any lubricant or resin on the fibers, which requires heating the glass fibers to about 600° F (column 2, lines 18-21).

In contrast, claim 1, as amended, recites in part: "said throughflow cylinder being comprised of fiber-reinforced plastic including at least one of aramide fibers and carbon fibers.". (Emphasis added.) Applicants submit that such an invention is neither taught, disclosed nor suggested by Bryand '375 and Rulon-Miller et al. '505 or any of the other cited references, alone or in combination, and has distinct advantages thereover.

Bryand '375 discloses an open structure for use in a suction roll or as a seal in a suction box. Relative to the sealing application, Teflon, combined with other materials, is suggested in order to reduce the coefficient of friction for the suction box seal. Rulon-Miller et al. '505 discloses the use of Teflon with glass fibers or particles for bearing applications. Contrary thereto the present invention relates to throughflow cylinders, also known as TAD (through air drying) cylinders. TAD drying cylinders are subjected to heat up to 300° C and have a diameter ranging from 2.5 meters up to 4.5 meters or more. Therefore TAD cylinders have to fulfill sophisticated requirements in regard to mechanical and thermal strength. TAD cylinders known in the art are made from titanium and therefore are very expensive. To reduce the cost, on the one hand, and to maintain the properties, the present invention makes the TAD cylinder from a plastic including reinforcing fibers. By using aramide and/or carbon fibers with plastic material these requirements can be fulfilled, because these materials have an extremely low coefficient of thermal expansion combined with high tensile strength. The glass fibers disclosed in Rulon-Miller et al. '505 have a much lower tensile strength and therefore are not usable for TAD cylinder application. In summary, Bryand '375 and Rulon-Miller et al. '505 fail to disclose or suggest a throughflow cylinder being comprised of fiber-reinforced plastic including at least one of aramide fibers and carbon fibers.

Advantages of the present invention is a throughflow cylinder which is more resistant to high temperatures and thermal shock while at the same time being more cost effective to manufacture.

In further contrast to Bryand '375 and Rulon-Miller et al. '505, claim 6, for example, recites in part: "said fiber-reinforced plastic includes at least one fiber layer selected to provide a coefficient of thermal expansion for said fiber-reinforced plastic smaller than a coefficient of

thermal expansion for steel at about 300° C.". (Emphasis added.) Applicants submit that such an invention is neither taught, disclosed nor suggested by Bryand '375 and Rulon-Miller et al. '505 or any of the other cited references, alone or in combination, and has distinct advantages thereover.

The combination of Bryand '375 and Rulon-Miller et al. '505 would presumably provide a suction roll assembly with improved abrasion and wear characteristics; whereas the present invention improves the thermal characteristics of a throughflow cylinder, while maintaining or improving the mechanical strength and lowering the cost of the cylinder. Therefore, the general conditions of the combination of claims 1 and 6 are not disclosed in the prior art, and claim 6 is not obvious by Bryand '375 and Rulon-Miller et al. '505. Further, as the coefficient of thermal expansion is a function of the temperature of the material, and is known to vary widely with temperature, it is not obvious to one of ordinary skill in the art to provide a fiber-reinforced plastic which includes at least one fiber layer selected to provide a coefficient of thermal expansion for the fiber-reinforced plastic smaller than a coefficient of thermal expansion for steel at about 300° C.

Advantages of the present invention is a throughflow cylinder which is more resistant to high temperatures and thermal shock while at the same time being more cost effective to manufacture.

In further contrast to Bryand '375 and Rulon-Miller et al. '505, claim 11, for example, recites in part: "wherein said fiber-reinforced plastic includes a plurality of fibers, greater than approximately 30% of said plurality of fibers are substantially oriented in a peripheral direction.".

(Emphasis added.) Applicants submit that such an invention is neither taught, disclosed nor suggested by Bryand '375 and Rulon-Miller et al. '505 or any of the other cited references, alone or in combination, and has distinct advantages thereover.

In order to establish a *prima facie* case of obviousness, the prior art references must teach or suggest all the claim limitations (MPEP 2142). As Bryand '375 and Rulon-Miller et al. '505 are completely silent regarding at least the orientation of the plurality of fibers, Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness relative to claim 11 (see also claims 12 and 13), for example, and that the present invention is not obvious by Bryand '375 and Rulon-Miller et al. '505.

Advantages of the present invention is a throughflow cylinder which is more resistant to high temperatures and thermal shock while at the same time being more cost effective to manufacture.

For all of the foregoing reasons, Applicants submit that claim 1, and claims 2-18, 35-46, 51 and 52 depending therefrom, are in condition for allowance, which is hereby respectfully requested.

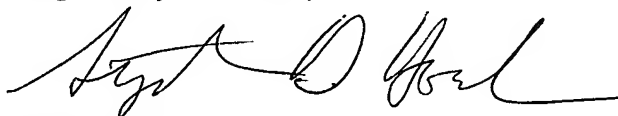
At page 3 of the Office Action claims 19-34 and 47-50 are indicated allowable, if rewritten in independent form including all of the limitations of the base claim and any intervening claims, for which courtesy the Examiner is thanked. Applicants have amended claim 19 to include the limitations of original claim 1. Claims 20-22 depend from claim 19. Applicants have amended claim 23 to include the limitations of original claim 1. Claims 24-34 depend from claim 23. Applicants have amended claim 47 to include the limitations of original claim 1. Claims 48-50 depend from claim 47. For all of the foregoing reasons, Applicants submit that claims 19-34 and 47-50 are in condition for allowance, which is hereby respectfully requested.

For the foregoing reasons, Applicants submit that no combination of the cited references teaches, discloses or suggests the subject matter of the amended claims. The pending claims are therefore in condition for allowance, and Applicants respectfully request withdrawal of all rejections and allowance of the claims.

In the event Applicants have overlooked the need for an extension of time, an additional extension of time, payment of fee, or additional payment of fee, Applicants hereby conditionally petition therefor and authorizes that any charges be made to Deposit Account No. 20-0095, TAYLOR & AUST, P.C.

Should any question concerning any of the foregoing arise, the Examiner is invited to telephone the undersigned at (260) 897-3400.

Respectfully submitted,



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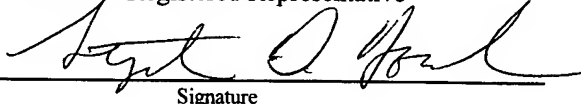
Agent for Applicant

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